submitted that, in *Fitzgibbon*, the detectors 20 and 22 receive light directly from emitters 12 and 14, respectively. Similarly, in *Burke*, the detector 5 receives light directly from emitters 54. In *Fitzgibbon*, the touch panel is activated when the light transmission path between the emitter 12 and the detector 20, and the light transmission path between the emitter 14 and the detector 22 are interrupted (see Abstract). Likewise, in *Burke*, the matrix of light sources 54 and emitters are located below a plurality of keys such that depresson of any single key will interrupt the light path between one of the light sources and one of the detectors. The interruption causes the change in the light transmitted in the transmission path between at least an emitter/detector pair. In contrast, the light receiver as claimed in claims 1 and 17 receives light from the first and second light emitters via reflection by the object present at the touch pad device.

For the above reason, claims 1 and 17 are clearly distinguishable over the cited *Fitzgibbon* and *Burke* references.

As for claims 2-9, 11-14, 16, 18-22 and 24-26, they are dependent from claims 1 and 17 and recite features not recited in claims 1 and 17. For reason regarding claims 1 and 17 above, it is respectfully submitted that claims 2-9, 11-14, 16, 18-22 and 24-26 are also distinguishable over the cited *Fitzgibbon* and *Burke* references.

At section 8, claims 10, 15 and 23 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Applicant has amended claims 10, 15 and 23 as suggested by the Examiner.

## CONCLUSION

Applicant has amended claims 10, 15 and 23 to place these claims in condition for allowance. Applicant has also claims 1 and 17. As amended, claims 1-19 are also allowable. Early allowance of claims 1-20 is earnestly solicited.

A marked-up version of the amended claims is shown in Exhibit A.

Respectfully submitted,

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**Exhibit A**

**Version with markings to show changes made**

1. (Amended) A method of sensing and detecting the presence of an object at a touch pad device having one or more input functions, wherein the touch pad device has a designated interaction area for allowing a user to use the object to interact with the touch pad device for facilitating said one ore more input functions, said method comprising the steps of:

providing at least one group of optical sensor components including a first light emitter, a second light emitter and a light receiver in the touch pad device at different locations thereof such that the receiver is capable of receiving via reflection a first amount of light emitted by the first light emitter and a second amount of light emitted by the second light emitter; wherein when the object is present at the touch pad device, causing a change in the first amount of light and the second amount of light,

measuring separately the change in the first amount of light and the change in the second amount of light for providing a first signal and a second signal indicative of the respective changes; and

determining the location of the object in the designated interaction area in relation to the first light emitter and the second light emitter based on the first and second signals.

10. (Amended) A method of sensing and detecting the presence of an object at a touch pad device having one or more input functions, wherein the touch pad device has a designated interaction area for allowing a user to use the object to interact with the touch pad device for performing said one or more input functions, said method comprising the steps of:

providing at least one group of optical sensor components including a first light emitter, a second light emitter and a light receiver in the touch pad device at different locations thereof such that the receiver is capable of receiving a first amount of light emitted by the first light emitter and a second amount of light emitted by the second light emitter; wherein when the object is present at the touch pad device, causing a change in the first amount of light and the second amount of light,

measuring separately the change in the first amount of light and the change in the second amount of light for providing a first signal and a second signal indicative of the respective changes; and

determining the location of the object in the designated interaction area in relation to the first light emitter and the second light emitter based on the first and second signals, wherein the first and second light emitters are operated in a pulsed mode of a predetermined frequency so that the changes in the first amount of light and the second amount of light contain a frequency component of the predetermined frequency, and [. The method of claim 1,] wherein the pulsed mode of the first and second light emitters are operated in a pulsed mode of a predetermined frequency with a first phase and said group of optical sensor components further includes a third light emitter positioned adjacent to the light emitter to provide a third amount of light to the light receiver, and wherein the third light emitter is operated in said pulsed mode with a second phase complementary of the first phase and the third light emitter is controlled such that the third amount of light is substantially equal to a sum of the first amount and the second amount when the object is not present at the touch pad device so as to reduce a frequency component in the sum of the first, second and third amounts.

15. (Amended) A method of sensing and detecting the presence of an object at a touch pad device having one or more input functions, wherein the touch pad device has a designated interaction area for allowing a user to use the object to interact with the touch pad device for performing said one or more input functions, said method comprising the steps of:

providing at least one group of optical sensor components including a first light emitter, a second light emitter and a light receiver in the touch pad device at different locations thereof such that the receiver is capable of receiving a first amount of light emitted by the first light emitter and a second amount of light emitted by the second light emitter; wherein when the object is present at the touch pad device, causing a change in the first amount of light and the second amount of light,

measuring separately the change in the first amount of light and the change in the second amount of light for providing a first signal and a second signal indicative of the respective changes; and

determining the location of the object in the designated interaction area in relation to the first light emitter and the second light emitter based on the first and second signals, wherein the touch pad device further includes a further group of optical sensor components including a third light emitter, a fourth light emitter and a further light receiver in the touch pad device at different locations thereof separating said first and second light emitters and the light receiver such that the further receiver is capable of receiving a third amount of light emitted by the third light emitter and a fourth amount of light emitted by the fourth light emitter; wherein when the object is present at the touch pad device, causing a change in the third amount of light and the fourth amount of light said method further comprising the steps of:

measuring separately the change in the third amount of light and the change in the fourth amount of light for providing a third signal and a fourth signal indicative of the respective changes; and

determining the location of the object in the designated interaction area in relation to the third light emitter and the fourth light emitter based on the third and fourth signals , wherein the first, second, third and fourth light emitters are operated in a pulsed mode of a predetermined frequency so that the changes in the first amount, the second amount, the third amount and the fourth amount of light contain a frequency component of the predetermined frequency, and [. The method of claim 14], wherein the pulsed mode of the first, the second, the third and the fourth light emitters has a first phase, and wherein said group of optical sensor components further includes a first compensation light emitter positioned adjacent to the light receiver to provide a first compensation amount of light to the light receiver, and said further group of optical sensor components further includes a second compensation light emitter positioned adjacent to the further light receiver to provide a second compensation amount to the further light receiver, and the first and second compensation light emitters are operated in a further pulsed mode of the predetermined frequency having a second phase complementary of the first

phase and the first and the second compensation light emitters are controlled such that the first compensation amount of light is substantially equal to a sum of the first amount and the second amount, and the second compensation amount of light is substantially equal to a sum of the third amount and the fourth amount when the object is not present at the touch pad device.

17. (Amended) A touch pad device to be used in conjunction with a measurement device, the touch pad device having a designated interaction area for sensing and detecting the presence of an object at the designated interaction area, said touch pad device comprising:

a light receiver provided in or near the designated interaction area, and

a first light emitter and a second light emitter provided respectively at a first location and a second different location in the designated interaction area such that the light receiver is capable of receiving <u>via reflection</u> a first amount of light emitted by the first light emitter and a second amount of light emitted by the second light emitter, wherein when the object is present at the touch pad device, causes a change in the first amount of light and the second amount of light, the change in the first amount of light and the change in the second amount of light being separately measured for determining the location of the object in the designated interaction area in relation to the first light emitter and the second light emitter.

23. (Amended) <u>A touch pad device to be used in conjunction with a measurement device, the touch pad device having a designated interaction area for sensing and detecting the presence of an object at the designated interaction area, said touch pad device comprising:</u>

<u>a light receiver provided in or near the designated interaction area, and</u>

<u>a first light emitter and a second light emitter provided respectively at a first location and a second different location in the designated interaction area such that the light receiver is capable of receiving a first amount of light emitted by the first light emitter and a second amount of light emitted by the second light emitter, wherein when the object is present at the touch pad device, causes a change in the first amount of light and the second amount of light, the change in the first amount of light and the change in the second amount of light being separately measured for</u>

determining the location of the object in the designated interaction area in relation to the first light emitter and the second light emitter, and[. The touch pad device of claim 17] wherein the designated interaction area has an upper right corner, an upper left corner, a lower right corner and a lower left corner, and

the first light emitter is provided at the upper right corner;

the second light emitter is provided at the upper left corner; and

the light receiver are positioned between the first and second light emitters, said touch pad device further comprising:

a third light emitter provided at the lower right corner;

a fourth light emitter provided at the lower left corner;

a second light receiver positioned between the third and fourth light emitters, and wherein the second light receiver is capable of receiving a third amount of light emitted by the third light emitter and a fourth amount of light emitted by the fourth light emitter for further determining the location of the object in the designated interaction area in relation to the third light emitter and the fourth light emitter based separately on a change in the third amount and the fourth amount, wherein the first, second, third and fourth light emitters are bi-wavelength emitters emitting light at a first wavelength and a second wavelength, and the light receiver and the second light receiver are receivers operated at the first wavelength;

a third light receiver operated at the second wavelength and positioned between the first and third light emitters, wherein the third light receiver is capable of receiving a fifth amount of light emitted by the first light emitter in the second wavelength and a sixth amount of light emitted by the third light emitter in the second wavelength for further determining the location of the object in the designated interaction area in relation to the first light emitter and the third light emitter based separately on a change in the fifth amount and a change in the sixth amount; and

a fourth light receiver operated at the second wavelength and positioned between the second and fourth light emitters, wherein the fourth light receiver is capable of receiving a seventh amount of light emitted by the second light emitter in the second wavelength and an eighth amount of light emitted by the fourth light emitter in the second wavelength for further

determining the location of the object in the designated interaction area in relation to the second light emitter and the fourth emitter based separately on a change in the seventh amount and a change in the eighth amount.